



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

From: Chris Rhyne and Nancy Hunt

To: Stephen Heare, Acting Director
Permits and State Programs Division

Subject: Report on Site Visit to Peach Bottom Nuclear Power Plant,
PECO Energy Company

Purpose, Location, and Participants

On July 7, 1998, members of the EPA mixed waste team and representatives from the State of Pennsylvania Department of Environmental Protection conducted a site visit at the Peach Bottom Nuclear Power Plant in Pennsylvania (see attached attendance list). The purpose of this visit was to gather information concerning the generation, storage, and disposal of low-level radioactive wastes, and mixed wastes. The site is located partly in Peach Bottom Township, York County, partly in Drumore Township, Lancaster County, and partly in Fulton Township, Lancaster County, in southeastern Pennsylvania on the westerly shore of Conowingo Pond at the mouth of Rock Run Creek. It is about 38 miles north-northeast of Baltimore, Maryland, and 63 miles west-southwest of Philadelphia, Pennsylvania.

Background

Peach Bottom, owned and operated by the PECO Energy Company, is a boiling water reactor (BWR) facility, located on a 620 acre site. Peach Bottom Units 2 and 3 have been in operation since 1974 (Unit 1 has been deactivated). Peach Bottom has a 40-year NRC license (expiration in 2014).

Peach Bottom has low-level radioactive waste (LLRW) staging/storage facilities onsite. Peach Bottom's LLRW facility consists of a concrete building with its own HVAC, remote onsite crane, truck bays, and control room. The Peach Bottom LLRW facility is designed to store up to 93,600 cubic feet of resin and 20,400 cubic feet of dry active waste (DAW).

The plant is arranged such that the main turbine-generator axis is parallel to the pond, and the reactor buildings are located to the west, or land side, of the turbine building. The circulating water cooling tower facility is located to the south of deactivated Unit 1, along the river bank, separated by the discharge canal on the land side. The nuclear system includes a single cycle, forced circulation, General Electric BWR producing steam for direct use in the steam turbine. The fuel for the reactor core consists of slightly enriched uranium-dioxide pellets contained in sealed Zircaloy-2 tubes. These fuel rods are assembled into individual fuel assemblies. There are 1528 fuel assemblies at Peach Bottom 2 and 3 combined with 63 rods per assembly. The reactor core is cooled by demineralized water which enters the lower portion of the core and boils as it flows upward around the fuel rods. The steam leaving the core is dried by steam separators and dryers and directed to the turbine through the main steam lines. Each unit utilizes a power conversion system to produce electrical power from the steam coming from the reactor, condense the steam into water, and return the feedwater to the reactor.

Peach Bottom utilizes three circulating water pumps per unit to deliver water to the condenser water boxes. The circulating water is screened to intercept and remove debris at the screen structure along the pond. The flow out of the condensers is pumped to five mechanical-draft cooling towers. The condensate and feedwater system takes condensate from the main condenser and delivers it to the reactor using three condensate pumps per unit. This maintains the reactor water level.

The radioactive waste systems are designed to control the release of plant produced radioactive material to within the limits specified in 10CFR20. This is done by various methods such as collection, filtration, holdup for decay, dilution, and concentration. The methods employed for the controlled release of these contaminants are dependent primarily upon the state of the material: liquid, solid, or gaseous.

The liquid radwaste system collects, treats, stores, and disposes of all radioactive liquid wastes. These wastes are collected in sumps and drain tanks at various locations throughout the plant and then transferred to the appropriate collection tanks in the radwaste building for treatment, storage, and disposal. Liquid wastes are processed on a batch basis, and each batch is sampled to determine that all discharge requirements are met prior to release from the waste system. Processed liquid wastes may be returned to the condensate system or discharged to the environs (Conowingo Pond) through the circulating water discharge canal.

Solid wastes originating from nuclear system equipment are stored for radioactive decay in the fuel storage pool and prepared for off-site shipment in approved shipping containers. Different methods are used for processing and packaging solid radioactive wastes, depending primarily upon the waste characteristics. Process solid wastes at Peach Bottom are collected, dewatered, and prepared for temporary on-site storage or off-site shipment in approved containers. The radwaste on-site storage facility is an interim storage facility designed to hold approximately 5 years of both dewatered and dry packaged solid radwaste. The collection, packaging, and storage

facilities are sufficient, in conjunction with other plant provisions for decontamination, shielding, and ventilation, to prevent an accidental release of radioactive solid waste.

The gaseous radwaste system collects, processes, and delivers gases from each main condenser air ejector, startup vacuum pump, and gland seal condenser to the stack for elevated release to the environment. The vacuum pump is used to establish initial vacuum or maintain partial vacuum when steam pressure is not adequate to operate the steam jet air ejector units. Gases from each main condenser air ejector are passed through a recombiner-adsorber train and high efficiency filters and exhausted through the stack. The off-gas effluent radiation monitor and control system is used to monitor the condition of reactor fuel and alert operators to the fact that off-gas levels are increasing.

Permit Status Under RCRA

The State of Pennsylvania at present is authorized for the base program under RCRA but has not been authorized for mixed waste. As a result the federal RCRA program does not have jurisdiction. Once the state picks up authorization for mixed waste, facilities generating or storing mixed waste can apply for interim status and subsequently submit a RCRA Part B permit application. Peach Bottom is currently subject to State of Pennsylvania law regarding applicability of RCRA on site. It is our understanding that the facility gets newly generated hazardous wastes off site within 90 days. When Pennsylvania becomes authorized for mixed waste, the facility may need to apply for a permit or interim status. Based upon the site visit of July 7, 1998 Peach Bottom appeared to be meeting national RCRA requirements for safe storage and management of its mixed waste in a frequently monitored, separate, fenced and locked storage facility with secondary containment in place in case a drum begins to deteriorate.

Waste Generation and Management

LLMW

PECO, the utility owner/operator of the Peach Bottom facility, is listed as a small quantity generator under RCRA. PECO has satellite accumulation areas for mixed waste within the Radiation Control Area (RCA) of the nuclear power plant. PECO transfers filled drums from the satellite accumulation areas to a controlled (using a 12 foot high, barbed-wire fence) storage area outside of the RCA and towards the entrance of the facility.

The storage area is identified by yellow and magenta color signs indicating the presence of hazardous and radioactive waste. Within the storage area is a "skid-mounted" prefabricated storage building with spill containment and a fire suppression system. The storage building is approximately 15 feet wide by 30 feet long and 10 feet high, and is divided into two equally-sized rooms. One room had seven, 63-gallon over-packed drums of mixed waste, in which the hazardous portion of the mixed wastes was primarily sludge and liquid paint related wastes from outage activities (although one drum was partially filled with lead paint chips). The labels on

these drums indicated that six of seven drums had been generated in 1992 and that the seventh drum was generated in October, 1994. The labels also indicated that drums contained wastes identified by RCRA Hazardous Waste Codes D001, D005, D007, D008, F003, and F005. The second room had a single 63-gallon over-packed drum of mixed waste, which consisted of spent Freon filters. The drum had a label that indicated that the waste was generated in January, 1998 and that the waste was listed as RCRA Hazardous Waste Code F001.

According to the facility representatives, most of the current mixed waste stored could be considered legacy waste. The time period in which this waste was generated is within the last 10 years. However, the facility representatives did state that future accumulation of waste generation could occur through decommissioning activities and steam cleaning.

During the transportation stage for waste treatment, two manifest procedures are followed (i.e., hazardous and NRC requirements). The primary vendors used by the facility are Diversified Scientific Services, Inc. (DSSI) and Molten Metal Technology (MMT). DSSI accepts the facility's pumpable solvent material, while MMT accepts any Freon waste/filters (the facility estimated a disposal cost of \$150 per gallon of solvent and \$2,000 per gallon of Freon).

Waste Minimization Efforts

The facility conducts a Control Materials Program (CMP) training course for all new employees. According to the facility representatives, the course covers all efforts that must be taken to achieve optimal waste minimization (including making every effort to avoid using hazardous materials in the RCA). All new employees must take this course prior to participating in activities that generate waste. Furthermore, all current employees must take an annual refresher course. The facility's representatives also emphasized that the plant's motto is to "only take in what you can use."

Disposition of Wastes Generated

Pennsylvania is in the Appalachian compact. The LLRW disposal facility for this compact was to have been in Pennsylvania. However, by compact agreement facilities in Pennsylvania are allowed to use the Barnwell land disposal facility in S.C. Peach Bottom projects an annual generation of LLRW of 10,000 cubic feet.

Summary of Facility Tour

10:00-10:30	Arrival at site
10:30-11:00	Discussion on past and present mixed waste generation
11:00-11:15	Health physics briefing and dosimetry hand-out
11:15-12:30	Visit the mixed waste storage area
12:30-1:30	Lunch (question and answer period)
2:00	Closing

List of Participants

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